What is claimed is:

1. A satellite for a communication system comprising:

at least one multiple mode feedhorn receiving or transmitting communication signals, said at least one multiple mode feedhorn comprising;

a transverse electric throat section;

a transverse electric profile section having a first step propagating a first transverse electric (TE) mode and a first transverse magnetic (TM) mode; and

a transverse electric aperture section having a second step propagating a second transverse electric (TE) mode and a second transverse magnetic (TM) mode canceling the first (TM) mode;

wherein said multiple mode feedhorn minimizes the propagation of transverse magnetic modes.

2. A satellite as in claim 1 wherein said transverse electric throat section comprises:

a first cylindrical section that has a first fore end and a first aft end; and

a first flared section that has a first tapered end and a first expanded end;

said first tapered end is coupled to said first aft end.

3. A satellite as in claim 1 wherein said transverse electric throat section input matches a desired TE mode as to minimize reflection of electromagnetic waves.

4. A satellite as in claim 1 wherein said transverse electric profile section comprises:

a second cylindrical section that has a second fore end and a second aft end, said second fore end is coupled to said first step; and

a second flared section that has a second tapered end and a second expanded end, said second tapered end is coupled to said second aft end.

5. A satellite as in claim 1 wherein said transverse electric aperture section comprises:

a third step coupled to a third flared section, said first flared step propagates a second TE mode; and

an output end that has an inner diameter that defines a mouth.

6. A satellite as in claim 1 wherein said at least one multiple mode feedhorn receives and transmits said communication signals.

7. A method of operating a multiple mode feedhorn comprising:

input matching received signals through non-reflective direct signal propagation;

exciting a first TE mode and a second TE mode;

propagating said first TE mode and a first TM mode with a first step of the multiple mode feedhorn;

propagating said second TE mode and a second TM mode with a second step of the multiple mode feedhorn;

canceling said first TM mode with said second TM mode; and

minimizing the propagation of transverse magnetic modes.

8. A method as in claim 7 further comprising impedance matching said received signals.

9. A method as in claim 7 further comprising amplitude and phase tapering said received signals that have frequencies within predetermined frequency bands.

10. A method as in claim 7 wherein exciting said first TE mode comprises receiving signals at frequencies within a frequency band range of approximately 14-14.5GHz.

11. A method as in claim 7 wherein exciting said first TE mode comprises receiving signals at frequencies within a frequency band range of approximately 11.7-12.2GHz.

12. A method as in claim 7 wherein exciting said first TE mode comprises introducing a step discontinuity at which a cutoff frequency is below an operating frequency.

13. A method as in claim 12 wherein said step discontinuity is placed at a diameter having a wavelength of approximately 1.7λ.

14. A method as in claim 12 wherein said step discontinuity is placed where an H-plane dimension is approximately 1.5λ.

15. A method as in claim 7 wherein canceling said TM mode comprises exciting signals of said TM mode 180° out-of-phase.

16. A method as in claim 7 wherein canceling said TM mode comprises propagating a second TM mode.